SECTION 2.3.8

NAVARRO RIVER WATERSHED

The Navarro River in Mendocino County, California, is listed on California's 303(d) report as a water quality limited water body requiring the establishment of a Total Maximum Daily Load (TMDL) due to sedimentation and temperature. Technical support documents for the TMDLs were developed in mid-2000. USEPA will promulgate the TMDLs to meet consent decree deadlines. The key stakeholder concern for the Navarro River is the decline of the once healthy coho salmon and steelhead trout fisheries thought to be associated with excess sediment load and elevated water temperatures. Recently, the Anderson Valley Land Trust, Mendocino County Water Agency, and the California State Coastal Conservancy jointly prepared a Navarro Watershed Restoration Plan, focusing on restoration opportunities related to sediment and temperature and their impact on salmonid species in the watershed.

WATERSHED DESCRIPTION

The Navarro River watershed is a coastal watershed in southern Mendocino County, California, encompassing approximately 315 square miles (201,600 acres). The Navarro River flows through the coastal range, the Anderson Valley, and out to the Pacific Ocean about fifteen miles south of the town of Mendocino. The watershed is the largest coastal basin in Mendocino County and can be subdivided into five major drainage basins: Mainstem Navarro River, North Fork Navarro River, Indian Creek, Anderson Creek, and Rancheria Creek. Three geologic formations comprise most of the Navarro River watershed: the Melange unit of the Franciscan Assemblage, the Coastal Belt of the Franciscan Assemblage, and alluvial fill. Elevations in the basin range from sea level to about 3,000 feet. Rainfall averages about 40 inches per year at Philo, with most of it occurring between December and March.

The population of the watershed is about 3,500 people, with most living in and around the towns of Boonville, Philo, and Navarro. State Highway 128 traverses much of the watershed, paralleling Rancheria Creek and the mainstem Navarro River for approximately twenty-five miles. Land-use in the watershed includes forestland (70%), rangeland (25%), and agriculture (5%) with a small percentage devoted to rural residential development. Timber production, livestock grazing and other agricultural activities have been present in the Navarro River watershed since the mid-1800s. Today, commercial timber harvesting, viticulture, orchards, grazing, and tourism are the principal economic enterprises.

As recently as 1985, the Navarro was considered to have the most anadromous habitat of any coastal stream in the county. The Navarro was famous for its coho (silver) salmon runs. Today the range and abundance of coho salmon have been reduced greatly and subsequently listed as endangered on the federal ESA list. The steelhead, although faring somewhat better than salmon due to a higher tolerance for high water temperature, also have been reduced severely.

The Navarro River basin supports a significant base of agriculture, livestock and timber (and, formerly, fishery) production. Sheep and cattle graze the open grassland areas, especially in the headwaters. Anderson Valley, the most settled part of the basin, supports significant orchard and viticulture industries. Recent vineyard development of the highest ridges surrounding the Anderson Valley has led to the official designation of Sky Island appellation. The lower basin supports mixed redwood-Douglas fir-forest, which has been heavily logged. While exploitation of these resources has been in part responsible for the damage to the salmon and steelhead resource, they continue to play an important role in the local economy. The enhancement of the fishery must be planned and carried out in a way that takes account of other land uses and respects property rights in the basin.

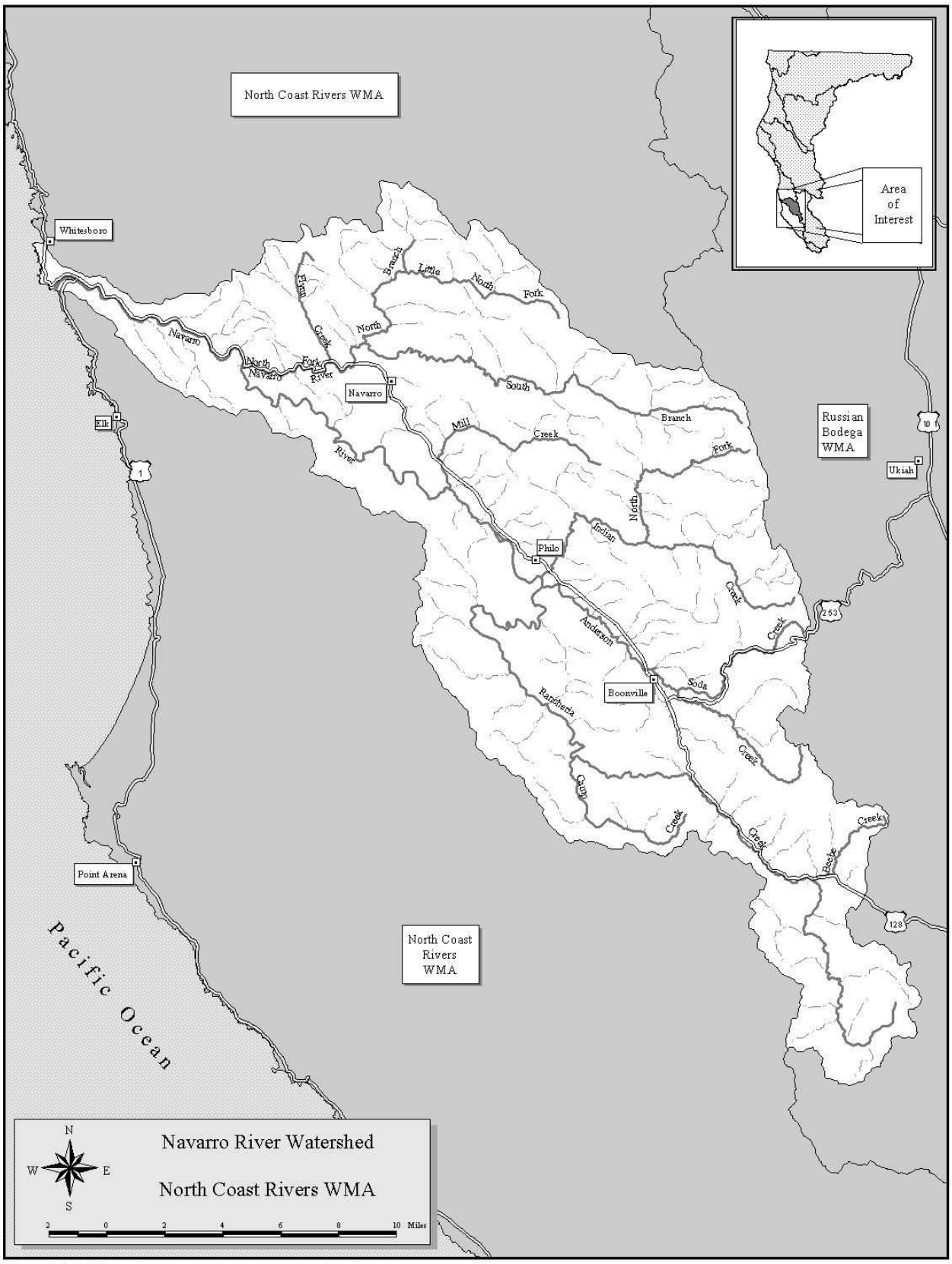

Figure 2.3.8.1. Navarro River Watershed

The watershed damage and concomitant damage to the anadromous fishery of the Navarro River basin is in large measure a result of accelerated erosion and sediment production, coupled with reduced flows in late summer due to agricultural diversion.

A more detailed description and map is available in the restoration plan, *Navarro Watershed Restoration Plan* (1998).

IMPLEMENTATION STRATEGY

The current activities in the watershed aimed at implementing a watershed restoration plan form the primary focus for implementing changes to address problems in the watershed. Regional Water Board staff is actively involved in that effort and is using the information developed in the process for the TMDL strategy for sediment and temperature.

A major challenge to a restoration effort is creation of public understanding of the health of the watershed and support for implementation of specific enhancement activities. Watershed health, and the survival of the coho, is inherently a cross-ownership, community effort in which everyone's actions, upland and downstream, are interconnected. Landowners, interest groups and community leaders should be fully engaged in this process in a non-judgmental, problem solving fashion to build the groundwork for the long-term effort of resource restoration and conservation and economic stability. We will continue to foster a watershed-wide collaborative approach to dealing with watershed problems. Outreach is being conducted by Regional Board staff to also educate vineyard landowners about best management practices for prevention of increased sedimentation of waters of the State and protection of the beneficial uses of water. Regional Board staff is continuing to expand outreach activities combined with needed enforcement activities to address this issue.

A TMDL was adopted by the Regional Water Board in January of 2001. Approval by the State Water Resources Control Board is pending. Core regulatory type functions, especially regarding groundwater contamination, will continue as high priority items on a site-specific basis.

Institutional Framework

The *Water Quality Control Plan for the North Coast Region* (Basin Plan) contains specific water quality objectives and implementation programs to protect and enhance identified beneficial uses of water. The over-arching regulatory provisions of the Basin Plan are the Action Plan for Logging, Construction and Associated Activities and the Nonpoint Source Action Plan. Provisions in that action plan will be the subjects of the upcoming TMDL waste reduction strategy.

The Anderson Valley Land Trust, Mendocino County Water Agency, and the California State Coastal Conservancy jointly sponsored a Navarro Watershed Restoration Plan, focusing on restoration opportunities related to sediment and temperature and their impacts on salmonid species in the watershed. The products of that effort will be included in the development of a TMDL waste reduction strategy for sediment and temperature by a Watershed Team.

A list of agencies and other groups participating in the process are provided in Appendix 2.3.8-A.

Summary of Activities

The overall emphasis in the WMA is developing a TMDL waste reduction strategy for sediment and temperature. Increased assessment activities and continued high priority forestry, grazing, and agricultural related activities including hillside vineyards, are parts of that effort.

Assessment and Monitoring:
Assessment of existing information and some ground-truthing was performed in developing the TMDL support documents. We will be drawing from existing information developed for a future restoration plan. Monitoring in the long term will be associated with determining the effectiveness of management practices to reduce erosion and sedimentation and determining trends towards the desired future condition Specific monitoring recommendations for temperature include a focused, coordinated monitoring study by the State of California (including CDFG, Division of Water Rights and Regional Water Board) that studies the flow and temperature patterns of areas with current diversions. This would reduce the uncertainty regarding the spatial extent of possible temperature problems from flow and estimates of eleven diversions. Implementation for temperature should include a program to continue to field test the temperature allocations and possible studies on averaging and monitoring techniques for shade. The SWAMP included up to six stations in the FY 2000-01 rotation: Navarro River near Dimmick State Park, Navarro River at Philo, North Fork Navarro at Dimmick, Mainstem Navarro at Dimmick, Indian Creek at Philo, and Rancheria Creek at Highway 128.

Education and Outreach:
It is hoped that the TMDL implementation process will enhance public and agency participation. Our intent is to improve the recognition of land use impacts on the aquatic environment from nonpoint sources and to foster adaptive management for overall watershed health. Increased emphasis on vineyard development is planned through the Nonpoint Source Program.

Coordination:
We currently coordinate with local and State agencies on an as-needed basis. Improved coordination is sought as part of the TMDL implementation process, especially with the Division of Water Rights.

Core Regulatory:
The current level of point source regulation (inspection, monitoring, and enforcement) on traditional dischargers is anticipated and covers wineries, underground tanks, etc., as well as construction related pollution.

Ground water:
Ground water issues center on petroleum contamination and will continue to receive the current level of activity. Ground water and surface water contamination is suspected at former and existing mill sites that historically used wood treatment chemicals. Discharges of pentachlorophenol, polychlorodibenzodioxins, and polychlorodibenzofurans likely occurred with poor containment typically used in historical wood treatment applications. These discharges persist in the environment and accumulate in surface water sediments and the food chain. Additional investigation, sampling and monitoring, and enforcement actions are warranted, but insufficient resources exist to address this historical toxic chemical problem.

Nonpoint Source:
Continued involvement in forestry, grazing and county road issues is necessary to ensure protection of aquatic resources. The recent listing of coho salmon as threatened under the federal Endangered Species Act has put the spotlight on all land use activities that potentially may increase sedimentation or otherwise affect habitat. The TMDL implementation process will increase work with local agencies and groups regarding land use effects on water quality, following the State Nonpoint Source Pollution Control Program strategy of first emphasizing self-determined “voluntary” implementation of controls to reduce nonpoint source pollution. An outreach program will enhance the effectiveness of the program. Appendix D contains additional program detail. Where land management activities

are found to be out of compliance with Basin Plan standards, Regional Water Board staff investigation and enforcement actions may be determined necessary.

Vineyards are rapidly expanding in the north coast region. Much of this expansion is occurring on hillsides where there is increased erosion potential and delivery of sediment to nearby streams. Outreach is being conducted by Regional Board staff to educate vineyard landowners of best management practices for prevention of increased sedimentation of waters of the State and protection of the beneficial uses of water. Regional Board staff is expanding outreach activities combined with needed enforcement activities to address this issue.

Road-related sediment is the dominant source of management-related sediment delivery across the Navarro watershed landscape. Vineyards have the potential to be locally significant, while use of conservation measures such as cover crops and contouring, as well as avoidance of areas prone to erosion can reduce the amount of sediment eroded. Regional Board staff believes that the potential for significant reductions of sediment delivery from vineyard erosion is great, based on the fact that most vineyards in the Navarro watershed are not incorporating the previously mentioned conservation practices. The vineyard density in some smaller watersheds, such as Mill, Lazy, and Floodgate creeks, has great potential to degrade the habitat in those small streams if conservation practices are not employed.

More resources are needed to:

- Identify erosion and sediment sources and potential sources, including sources related to new development of hillside vineyards
- Conduct outreach on best management practices for hillside vineyards

Timber Harvest:
The Regional Board has an extensive Timber Harvest program where staff review and inspect timber harvest plans for implementation of the Forest Practice Rules and best management practices to ensure protection of water quality and beneficial uses. We are expanding our program activities on private land in concert with California Department of Forestry and Fire Protection.

Local Contracts:
The Regional Board will continue active involvement in the Clean Water Act sections 319(h) and 205(j) grant programs and Water Bond (Proposition 13) grant program, as well as promoting other programs like the California Department of Fish and Game programs.

Water Quality Planning:
The Basin Plan review process feeds into the activities to the extent issues were identified in the Triennial Review and applicable to the Navarro WMA. The top priority issues are:

- Consider revisions to the water quality objectives for dissolved oxygen and temperature
- Review the Nonpoint Source Control Measures

Additionally, the TMDL strategy will be incorporated into the Basin Plan at some future date.

Evaluation and Feedback
The Regional Board plans to evaluate the overall effectiveness of the process on a yearly basis, adjusting the activities as appropriate. The final evaluation once the TMDL implementation plan (strategy) is developed will feed into the next cycle of assessment and problem identification.

ASSESSMENT AND PROBLEM IDENTIFICATION

The beneficial uses for the salmonid fishery are currently impaired. Freshwater habitat conditions in the Navarro River and its tributaries have degraded and are not adequate to support the beneficial uses. The degradation in freshwater habitat conditions has contributed to a dramatic decline in the populations of coho and steelhead from historical levels. Current stream temperatures tend to be lowest in small tributary streams, and highest in locations on the main streams of Anderson, Indian, and Rancheria Creeks, and on the Navarro. The active channels are wider than natural in many reaches with high stream temperatures. Riparian vegetation in some of these reaches is sparse. Regional Water Board staff analyzed available data to determine the extent to which various factors are affecting stream temperatures in the Navarro and its tributaries. It is highly likely that summertime water temperatures in the streams of the Navarro River watershed have been altered upward during the past fifty years. Land use activities, water withdrawals, changes in flow, dam construction and associated water releases, point source discharges, and natural factors have contributed to the change.

The results of a sediment source analysis show that human-caused sediment sources deliver approximately 40% of the total sediment yield of the Navarro River watershed. The dominant sources of human-caused sediment delivery (road-related sources) reflect the dominant land uses of the watershed. Both timber production and ranching make use of a vast network of roads, which deliver the majority of the human-caused sediment. Vineyards, which occupy approximately five percent of the watershed, have the potential to deliver large volumes of sediment to streams, and thus have potential to cause locally significant deleterious impacts.

Available data indicate that aquatic habitat could be improved by reducing sediment delivery, increasing large woody debris for sediment metering and habitat, and enhancing the riparian canopy cover to reduce stream temperatures.

This section will be further developed in the future. In summary, the primary water quality problems are sedimentation and increased water temperatures. Water diversions are an issue the Division of Water Rights is addressing.

WATER QUALITY GOALS AND ACTIONS

The primary goals center around protection of the beneficial uses associated with aquatic life and drinking water supplies. The development of the TMDL waste reduction strategy for sediment and temperature is the highest priority for action in the watershed. For the Navarro temperature TMDL, the Regional Board is setting numeric targets by estimating the natural water temperatures for the watershed. In addition, a target condition related to flow is being set. New and redirected funding has been focused on new staff and/or contracts to assist in developing and implementing the TMDL waste reduction strategy and hillside vineyard outreach and needed enforcement activities.

GOAL 1: Protect surface and ground water DOM, REC-1, and REC-2 uses
GOAL 2: Protect and enhance beneficial uses associated with anadromous fishes COLD

BUDGET

The Regional Board will attempt to fund the highest priority actions as identified in this WMA to the extent funding constraints allow that, and will pursue additional funding for those actions we are currently unable to address. Additional needs are detailed in Appendix 2.3.8-B for monitoring and assessment and in Appendix D for nonpoint source program activities.

Navarro Watershed Restoration Plan. A Joint Project of the Mendocino County Water Agency, the California Coastal Conservancy, and the Anderson Valley Land Trust, prepared by Entrix, Inc., Pacific Watershed Associates, Circuit Rider Productions, Inc., The Navarro Watershed Community Advisory Group, Daniel T. Sicular, Ph.D.

Additional funding to continue to expand outreach and enforcement activities on hillside vineyards is needed to pursue the actions we are currently unable to address.

Appendix 2.3.8-A

Partial listing of agencies and groups in the Navarro River watershed with water quality jurisdiction and interests.

United States
- Environmental Protection Agency
- Fish and Wildlife Service
- National Marine Fisheries Service
- Natural Resources Conservation Council

California State
- California Environmental Protection Agency
- Department of Forestry and Fire Protection
- Department of Fish and Game
- Board of Forestry
- Department of Water Resources
- California Coastal Conservancy

Mendocino County
- Water Agency
- Mendocino Resource Conservation District

Public Interest Groups
- Anderson Valley Land Trust
- Pacific Watershed Associates
- Circuit Rider Productions, Inc.
- The Navarro Watershed Community Advisory Group

Appendix 2.3.8-B

Monitoring priorities and needs detail for the Navarro WMA

Additional assessment by Regional Water Board staff is needed to test hypotheses about support of beneficial uses MUN, REC1, COLD, RARE, or provide assessment information essential for program implementation. They are currently not funded.

The estimates are Regional Water Board needs on a per year basis with fiscal years identified.

1. **TMDL Monitoring - $92,000 - (0.7 PY + $15,000) – FY 01-02, 04-05, 07-08, 12-13, ongoing at 5-year increments**
   Instream and hillslope conditions should be monitored to gauge success and progress of implementation and to provide feedback into the implementation process.

2. **Log Mill Biological Assessments - $48,000 (0.3 PY + $15,000) – FY 01-02, 04-05**
   Documentation of conditions and monitoring of the aquatic biota should be conducted to assess the potential problems at historic wood treatment sites at old and existing log mills. Macroinvertebrate sampling under the SWAMP will provide some evaluation of aquatic conditions in this regard as well as begin to establish baseline information for future studies.